Poor Sleepers Who Do Not Complain of Insomnia: Myths and Realities About Psychological and Lifestyle Characteristics of Older Good and Poor Sleepers

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Psychological adjustment, lifestyle, and sleep parameters were investigated in 634 older community residents. Participants were divided into three categories: good sleepers, poor sleepers experiencing high distress, and poor sleepers experiencing minimal distress. Results indicate that (1) highly distressed poor sleepers manifested an anxious, depressed, negative cognitive-affective set; (2) many coped well with age related changes in sleep quality — they resembled good sleepers in the relative absence of psychological maladjustment they displayed; (3) the three groups had similar lifestyles, but they differed in the cognitive-affective evaluation of their activities, (4) the insomnia complaint is itself multifaceted and is comprised of three distinct elements — difficulty sleeping, distress, and daytime fatigue; (5) sleep practices (e.g., naps, bedtimes) are not implicated in chronic poor sleep; and (6) many commonly held assumptions about sleep disruptions in older individuals are myth rather than reality. Implications for better understanding and treating insomnia in older individuals are discussed.

INTRODUCTION

There are a host of age-related changes in sleep and wakefulness; all are in the direction of impaired sleep (Morin, 1993). Older people generally experience a reduction in deep sleep, increased nighttime wakefulness, more frequent early morning awakenings, and increased fragmentation of sleep; there is also some reduction in deep sleep, rapid-eye movement (REM) sleep, and total nighttime sleep (Brabbins *et al.*, 1993; Buysse *et al.*, 1992; Carskadon *et al.*, 1982; Dement *et al.*, 1985; Hauri, 1982; Miles and Dement, 1980; Prinz *et al.*, 1990).

Psychophysiological factors associated with aging resemble the pattern in nonelderly insomniacs (e.g., Engle-Friedman and Bootzin, 1981) and it seems clear that the changes accompanying normal aging are likely to predispose older individuals to perceive themselves as suffering from a sleep disorder. Indeed, while the prevalence of insomnia complaints has been estimated at 30–40% for the general population (American Psychiatric Association, 1994), it is between 50 and 60% for individuals age 60 and over (Chen and Foley, 1994; Monjan, 1994). Persistent and distressing difficulties in initiating and/or maintaining sleep (DIMS) have been estimated at between 10 and 35% of people over 65, with concomitant increased use of medical facilities and medications (Brabbins *et al.*, 1993; Dement *et al.*, 1982; Ford and Kamerow, 1989; Gallup Organization, 1991; Mellinger *et al.*, 1985; Monjan, 1994; Tait, 1992).

Despite developmental psychophysiological changes in sleep patterns, not all older adults complain of impaired sleep (Dement *et al.*, 1982; Monjan, 1990). The question arises, Why do not *all* aging individuals report insomnia? Why does the magnitude of the sleep complaint not match the severity of the psychophysiological deficit in older individuals, as it usually does (Bootzin and Engle-Friedman, 1987; Prinz *et al.*, 1984) in middle-aged adults? To understand this phenomenon we set out to identify those factors which differentiate older individuals who do and those who do not complain of insomnia.

Although it is well documented that pain, medical and psychiatric illness, and drug side effects — i.e., "comorbidities" — all adversely affect sleep in seniors, the ubiquity of chronic sleep complaints, even in the "well elderly," has prompted a variety of explanations related to lifestyle factors. The following have all been proposed: irregular schedules permitted by retirement, napping, early bedtimes, overly long periods spent in bed, unrealistic expectations about sleep needs, and erroneous beliefs about how well comparable age peers sleep, as well as major life stresses such as death or illness in a loved one. Given the pervasiveness of such beliefs and the numerous successful treatment programs which focus on changes in these realms (e.g., Bootzin, 1985; Edinger *et al.*, 1992; Hoelscher and Edinger, 1988; Morin *et al.*, 1993a), the lack of confirmatory data for these assumptions is truly astounding.

It has also been suggested that hyperarousal — physiological, cognitive, or affective — plays a key, predisposing part in insomnia. In particular, a central role has been postulated for cognitive arousal (e.g., Borkovec et al., 1981; Fichten and Libman, 1991; Coyle and Watts, 1991; Kuisk et al., 1989; Lichstein and Fanning, 1990; Lichstein and Rosenthal, 1980; Morin et al., 1993; Sanavio et al., 1990). Indeed, most researchers and clinicians now implicate negative, worrying and intrusive thoughts in the experience and maintenance of sleep disorder (Morin, 1993). Evaluation of cognitive therapies addressing aspects such as beliefs and attitudes about sleep has recently begun (Morin, 1994; Morin et al., 1993b). However, there has been little systematic investigation into the nature of thoughts which people have when trying to fall asleep (Fichten et al., 1995), even though available data indicate that thoughts, in general, do distinguish between younger good and poor sleepers (Marchini et al.., 1983; Van Egeren et al., 1983).

There is a vast body of literature on personality and psychological adjustment factors in younger and middle-aged individuals experiencing sleep problems (e.g., Coursey et al., 1975; Hauri and Fisher, 1986; Kales et al., 1984; Paulsen and Shaver, 1991; Schneider-Helmart, 1987) as well as on the import of daytime stressors (Healey et al., 1981; Rubman et al., 1990; Waters et al., 1993; White and Nicassio, 1990). With several notable exceptions (Frisoni et al., 1993; Morin and Gramling, 1989; Gourash-Bliwise, 1992; Monk et al., 1992; Morgan et al., 1988, 1989), there is little available information about the relationship between sleep parameters and psychological and lifestyle factors for aging individuals, even though the sleep complaint of most older persons differs from that of younger insomniacs — i.e., sleep maintenance as opposed to sleep onset latency problem.

In spite of the well known axiom that people seek treatment for insomnia when they are distressed by the problem (e.g., Morin et al., 1993a) or by its consequences (Stepanski et al., 1989), until recently definitions of psychophysiological and subjective disorders in initiating and maintaining sleep (DIMS), such as those available in DSM-III-R (American Psychiatric Association, 1987) and the ICSD Diagnostic and Coding Manual (ASDA, 1990), focused primarily on the objective, behavioral aspects of the sleep disruption. Only relatively recently has the concept of distress related to the sleep problem been recognized as a central feature of insomnia (American Psychiatric Association, 1994). In evaluating predisposing factors for insomnia, cognitive, affective and lifestyle aspects have usually not been considered, even though there is evidence that stress — psychological (Waters et al., 1993; White and Nicassio, 1990), environmental [e.g., poverty (Tait, 1992)], and physical [e.g., ill health (Healey et al., 1981)] — is associated with poor sleep.

The distress experienced by people who complain of insomnia and the decline of psychosocial functioning often seen among insomnia patients have been proposed as intervention targets in their own right. For example, Chambers and Keller (1993), in their recent review of the literature, concluded that the relatively small amount of sleep deprivation in many insomniacs cannot account for the magnitude of their complaints or their reported daytime sleepiness and fatigue. There are other reasons, also, for targeting more general aspects of adaptation. Adam *et al.*'s (1986) data revealed metabolic differences between good and poor sleepers which are compatible with the commonly observed high anxiety and arousal in people complaining of DIMS; these investigators interpreted their findings as indicating that people complaining of insomnia may need more sleep for anabolic restoration, but actually get less. Therefore, intervening in potentially modifiable aspects of adjustment and lifestyle in older individuals may result in beneficial changes to the experience and complaint of insomnia.

In view of such findings and their implications, the major goal of the present investigation was to explore and compare psychological adjustment and lifestyle in older adults with and without insomnia. It has been suggested that the insomnia complaint is possibly more closely related to waking lifestyle and adjustment than to nocturnal factors (Bootzin, 1985; Chambers and Keller, 1993). Therefore, our examination included not only nocturnal sleep parameters, but also the accompanying thoughts, feelings and behaviors, as well as various indices of lifestyle and daytime activities, adjustment, and functioning.

To our surprise, this broadened evaluative process resulted in the identification of three distinct categories. There were the expected two groups: good sleepers with no complaints and poor sleepers who were highly distressed by their insomnia. In addition, we were able to actually identify a second reasonably large group of very poor sleepers — people who manifested fairly severe DIMS but were minimally or not at all distressed by this. Although the existence of such individuals has been suggested (e.g., Chambers and Keller, 1993; Lichstein and Rosenthal, 1980; Seidel *et al.*, 1984; Stepanski *et al.*, 1989), their characteristics have not, as yet, been identified.

In their thought-provoking review of studies comparing sleep parameters of good sleepers with those of self-identified poor sleepers, Chambers and Keller (1993) demonstrate that, on average, insomniacs' total sleep time is only 35 min less than that of good sleepers. The absolute magnitude of this difference is small compared to reductions in sleep well tolerated by normal sleepers. Therefore, they postulate that other aspects, most specifically state and trait anxiety (cf. Chambers and Kim, 1993), contribute to poor sleepers' complaints both about the magnitude of the sleep problem and about their daytime experience of fatigue and sleepiness.

Although the general rationale is compelling, Chambers and Keller's (1993) attempt to minimize the difference in sleep parameters between good sleepers and insomniacs puts a strain on their argument; the upper range of mean differences between good and poor sleeper groups still approached 1.25 hr, at which point it is difficult to deny clinical significance. The ideal comparison group for the evaluation of the role of wake time factors in the experience of insomnia is precisely the Low Distress Poor Sleeper group which we identified — i.e., people who manifest a similar magnitude of sleep disruption to that of insomnia complainers, while demonstrating a generally low level of distress about their sleep disruption, making them resemble good sleepers in this regard.

Therefore, the major objective of the present investigation was to explore the relationship between trait and state aspects of psychological adjustment, lifestyle factors, and sleep parameters in older good sleepers and in older poor sleepers who were either highly distressed or minimally distressed by their disrupted sleep. A second goal was to substantiate some of the widely held — but poorly documented — assumptions about sleep, aging, lifestyle, and insomnia in aging individuals.

METHOD

This investigation was conducted in two stages. An extensive evaluation was made on a sample of individuals who met the strict screening criteria used in our larger study of sleep, aging and non-pharmacological treatment of insomnia (Creti *et al.*, 1994a; Fichten *et al.*, 1995; Libman *et al.*, 1995) (Sample 1). A second evaluation using a new, larger sample as well as different measures provided replication and extension of the findings (Sample 2). The definitions and selection criteria for good and poor sleepers were very elaborate; this resulted in truly "excellent" and truly "horrible" sleepers in our contrast groups. In general, we expected minimally distressed poor sleepers to be particularly well adjusted in comparison with highly distressed poor sleepers.

Measures

Demographic and Socioeconomic Factors

Background Information Form. This is a modified version of a short questionnaire used in our previous studies on aging (Libman *et al.*, 1987, 1989a, 1989b). It has nine items and provides socioeconomic, personal, and

demographic descriptors (e.g., age, sex, marital status). Education is evaluated in three categories (higher = more) and income in six (higher = greater). Adequacy of income is assessed using a 9-point scale (1 = inadequate, 9 = more than adequate).

Sleep Measures

Structured Sleep History Interview. A modified version of the clinical instrument developed by Lacks (1987) was used. Most questions require a yes/no answer, with prompts in case of suspected difficulty. The measure provides information on exclusion criteria (e.g., sleep apnea, parasomnias, physical disorders, sleep phase disorder, medication use, use of hypnotics and sedatives) and explores selected sleep lifestyle factors (e.g., days per week falling asleep outside the bedroom) and concepts such as expectations and beliefs about sleep (e.g., whether one's sleep is better, the same, or worse than that of others the same age, how long one would like to be able to sleep each night, whether is it easier to fall asleep outside the bedroom).

Sleep Questionnaire. This brief objective questionnaire inquires about typical sleep experiences, including time spent in bed, hours slept per night, duration and frequency of nocturnal arousals, sleep medication use, usual, earliest and latest bedtimes and arising times during a typical week, and frequency (0–7 days/week) of: daytime fatigue due to lack of sleep, naps, experienced difficulty falling asleep, getting back to sleep after nocturnal awakenings, and falling asleep after waking up too early. It also inquires how frequently (0–7 days/week) each of these three sleep problems is accompanied by feelings of distress. The information provided allowed us to (1) diagnose the presence or absence of a disorder of initiating or maintaining sleep (DIMS) (ASDA, 1990), (2) obtain ratings of respondents' subjective perceptions of the frequency of sleep problems (Sleep Difficulty: Occurrence of Sleep Problems 1 = very rarely, 10 = very often) and the associated distress (Sleep Distress: Level 1 = not at all, 10 = very much), and (3) compute two derived frequency scores — Sleep Difficulty: Frequency of Problem Episodes and Sleep Distress: Frequency of Distress Episodes — which provide single summary frequency scores (0–21: higher scores indicate more frequent sleep problem/distress episodes experienced during the week). Our data show that scores based on this measure have acceptable psychometric properties for research use; test–retest correlations indicate reasonable temporal stability (*r* values range from .56 to .84), and as can be in Table I, the pattern of correlations among variables shows logical, highly significant relationships.

Table I. Relationships Among Sleep/Insomnia Characteristics

	Time: Actual			Time: Desired	Sleep Strategies	Sleep Difficulty			Daytime		Sleep Distress	
	Sleep	Wake	Sleep Efficiency			Fre-quency	Occur-rence	Self-Efficacy	Fatigue	Sleepiness	Fre-quency	Level
Time: Actual												
Total Sleep Time												
Sample 1		-.74**	.80**	.54*	-.25**	-.68**	-.65**	.50**	-.18*	-.13	-.50**	-.51**
Sample 2		-.56**	.67**		-.22**	-.56**	-.59**				-.45**	-.40**
Total Wake Time												
Sample 1			-.97**	-.26**	.23**	.62**	.60**	-.44**	.09	.06	.43**	.43**
Sample 2			-.97**		.31**	.84**	.70**				.72**	.60**
Sleep Efficiency												
Sample 1				.30**	-.27**	-.65**	-.64**	.48**	-.11	-.07	-.47**	-.48**
Sample 2					-.33**	-.87**	-.75**				-.75**	-.63**
Time: Desired Sleep					-.01	-.22**	-.19*	.09	.06	-.02	-.05	.02
Sleep Strategies												
Sample 1						.29**	.25**	-.29**	.11	-.01	.27**	.25*
Sample 2						.31**	.36**				.27**	.28**
Sleep Difficulty												
Frequency of Problem Episodes												
Sample 1							.81**	-.68**	.38**	.29**	.75**	.62**
Sample 2							.79**				.83**	.62**
Occurrence of Sleep Problem												
Sample 1								-.70**	.31**	.27**	.66**	.73**
Sample 2											.65**	.64**
Self-Efficacy									-.34**	-.28**	-.70**	-.68**
Daytime Functioning												
Fatigue										.56**	.38**	.40**
Sleepiness											.37**	.32**
Sleep Distress												
Frequency of distress episodes												
Sample 1												.78**
Sample 2												.75**
Level of distress												
Sample 1												
Sample 2												

Note. Sample 1 unless noted otherwise. Sample sizes vary from 170 to 189 in Sample 1 and from 374 to 445 in Sample 2.
*p < .05.
**p < .01.

Self-Efficacy Scale (Sleep). This 9-item scale evaluates individuals' beliefs about their ability to influence their own sleep-related motivation and behavior. Validity data indicate higher scores (stronger sleep self-efficacy expectations) after behavioral treatment for insomnia (Cook and Lacks, 1984; Lacks, 1988).

Sleep Strategies Listing. Participants indicated what they do when experiencing trouble sleeping in response to two interview questions ("What do you do when you can't sleep?" and "What self-help remedies have you tried for your sleep problem?") and one open-ended questionnaire item ("Describe what you do when you have problems falling asleep"). Responses were pooled and scored in accordance with a coding manual (Creti *et al.*, 1994b) into 20 behavior categories (e.g., have an alcoholic drink, pray, read). Scores reflect the number of different sleep behaviors noted.

Sleep Strategies Questionnaire. This measure is based on the open-ended Sleep Strategies Listing task completed by Sample 1. Respondents rate, on a 5-point scale, how often they engage in each of 30 activities when having problems falling asleep or getting back to sleep at night (0 = never or hardly ever, 4 = very often). Ratings are summed to provide an overall score which reflects the frequency of using sleep strategies. Unpublished data suggest that the scale has acceptable psychometric properties for research purposes.

Stanford Sleepiness Scale (Hoddes et al., 1973). This frequently used measure of daytime sleepiness consists of seven Guttman-scaled items ranging from 1 (feeling active and vital; alert; wide awake) to 7 (lost struggle to remain awake). Respondents select the one option which best describes how sleepy they feel most days.

Psychological Adjustment: State Measures

Pre-Sleep Arousal Scale. Sixteen 5-point rating scale items assess the phenomenology of the pre-sleep state. Two scores are derived: Somatic and Cognitive arousal (e.g., "a tight tense feeling in your muscles," "thoughts keep running through your head," respectively). Nicassio *et al.* (1985) showed good psychometric properties for this scale. Subscales were shown to be internally consistent and stable over time. Reported Cronbach's alphas for subscales ranged from .67 to .88 and test–retest correlations ranged from .72 to .76. Means for insomniacs were significantly higher than for normal sleepers for both subscales.

Overall Level of Tension While Trying to Fall Asleep. A single item inquires about the level of tension typically experienced while trying to fall asleep (11 point scale: 0 = not at all tense, 100 = very tense, with ratings

made at 10-point intervals). Psychometric data indicate acceptable reliability and validity for research (Fichten *et al.*, 1995).

Anxious Self-Statement Questionnaire (ASSQ). The frequency of anxious self-talk is evaluated by this 32-item self-report measure. Kendall and Hollon (1989) indicate that reliability for the measure is acceptable (split-half reliability was .92, item–total correlations ranged from .45 to .79) and that it is sensitive to a stressful event. Higher scores indicate more anxious self-talk. In the present investigation, respondents were asked to base their responses on periods of sleeplessness.

Cognitive Content Questionnaire. This thought listing form consists of ruled lines which allow respondents or interviewers to indicate, in an open-ended manner, the content of an individual's thoughts when trying to fall asleep as well as the valence [pleasant (+) or unpleasant (–)] of each thought reported. Where respondents failed to indicate valence, two trained coders, blind to the sleep status of participants, classified thoughts as pleasant (+), unpleasant (–), or neutral/unclassifiable. Criteria developed by Fichten and Lennox (1993) were used. Average interrater agreement on three spot checks of reliability was 83%, with a minimum of 76%. Data indicate that Positive and Negative frequency scores based on this measure are logically related to relevant criterion variables (Fichten *et al.*, 1995).

Self-Statement Test: 60+ (SST:60+). This 34-item inventory measure of valenced thoughts experienced during times of wakefulness was developed by our team. Respondents indicate, using a 5-point scale (0 = never or hardly ever, 4 = very often), how often during periods of wakefulness they experience each of 17 positive and 17 negative thoughts (e.g., "enjoyable things I did during the past few days" "poor health of family members or friends"). Positive and Negative frequency scores are each summed. Data reported elsewhere (Fichten *et al.*, 1995) indicate good psychometric properties for this test: Internal consistency was shown to be high (Cronbach's α = .903 for Positive and .898 for Negative thoughts). Temporal stability was also shown to be high (test–retest correlation coefficients ranged from .79 to .95) and construct validation data indicate that the measure is a valid index of self-statements during periods of nocturnal wakefulness in older individuals.

Psychological Adjustment: Trait Measures

Brief Symptom Inventory (BSI) (Derogatis et al., 1976). A brief (53 item) self-report psychological symptom inventory, the BSI has subscales for nine symptom dimensions and three global indices. It is a brief version of the SCL-90 (Derogatis, 1977) — a frequently used instrument with ac-

ceptable reliability and validity. Validation data indicate correlations from
.92 to .98 between the symptom dimensions and global indices of the BSI
and the SCL-90 (Derogatis, 1977). Normative data for an elderly sample
are provided by Hale *et al.* (1984). In the present investigation, one symp-
tom score (Depression) and one global score (Global Severity Index) are
used. Lower scores indicate better adjustment.

Eysenck Personality Inventory (EPI) (Eysenck and Eysenck, 1968). This
reliable and valid empirically based questionnaire is among the most fre-
quently used measures of personality (Digman, 1990). It evaluates the
dimensions of Neuroticism, Extraversion-Introversion, and the tendency to
respond in a socially desirable direction. Only the Neuroticism subscale is
of interest in the present investigation. Higher scores indicate greater
Neuroticism.

Penn State Worry Questionnaire (Meyer et al. 1990). On 16 items re-
spondents indicate, using a 5-point scale, how typical of them each
statement is. Internal consistency evaluations obtained in the eight valida-
tion studies conducted by the authors ranged from coefficient alpha scores
of .91 to .95. Test–retest reliability coefficients ranged from .74 to .92. Data
provided concerning concurrent and criterion group validity showed accept-
able results. Higher scores indicate a more worrying personality style.

Satisfaction with Life Scale. Developed by Diener *et al.* (1985), this
scale evaluates the cognitive, judgmental aspect of subjective well-being. It
consists of five items which use a 7-point Likert scale. Higher scores indi-
cate greater life satisfaction. Data reported by the authors as well as in
later investigations (Pavot *et al.*, 1991) indicate good psychometric proper-
ties; the measure has been shown to be internally consistent (item–total
correlations varied from .55 to .80), items loaded on a single factor, and
scores were found to be highly correlated with other measures of life sat-
isfaction. What makes this measure different from most of the others used
in the present investigation is that *it measures the presence of good adjust-
ment,* rather than the absence of psychological problems.

Lifestyle Activities Measures

Activities Questionnaire. Designed by our team to examine the nature,
quality, and regularity of respondents' daytime activities (Creti *et al.*, 1992),
this measure elicits information regarding how occupied respondents expe-
rience themselves to be (How Busy: 10-point scale). In addition,
respondents indicate the frequency (0 to 7 days/week) and pleasantness
(1 = very unpleasant, 10 = very pleasant) of 23 obligations and leisure ac-
tivities (e.g., visits to doctor, caring for pets, watching TV, volunteer work,

socializing). The frequencies of pleasant and unpleasant activities is summed to yield two scores: Positive Activities, Negative Activities. A "Diversity of Activities" score is the number of different activities carried out at least once a week (maximum = 23).

Daytime Activity Record Form. This single page, which reflects a 1-week segment, is used in our clinical evaluation battery at the SMBD Jewish General Hospital Behavior and Sex Therapy Service. The format allows respondents to note, on a daily basis, what time specific routines occur (e.g., wake-up, meals, bedtime) and what activities occur in the time segments between these routines. Here, we report a "Variability in Meal Times" score which reflects the mean of the daily deviations of meals from the weekly averages. Scores are expressed in hours; higher values indicate greater variability. A "Daytime Quality" rating (1 = very unpleasant, 5 = very pleasant) was also included for each day; the mean of the week's ratings provides information on overall subjective quality.

Life Events Scale. This is a 10-item inventory of potentially stressful major life events experienced by older individuals (e.g., retirement, death of a close friend). Subjects indicate which of these they experienced in the last 6 months. This measure has been used with an aging sample in a recent study (Siegel, 1990) in which stress response was shown to vary with certain personal environmental factors. Higher scores indicate more stressful life events.

Subjects and Procedure

Grouping Participants into Three Sleep Status Groups: Good Sleepers, High Distress Poor Sleepers, and Low Distress Poor Sleepers. Poor Sleepers were those who met the ASDA (1990) criteria for the diagnosis of psychophysiological insomnia (30 min of undesired awake time at least three times per week, problem duration at least 6 months) and whose Sleep Questionnaire responses indicated both a relatively high Sleep Difficulty: Frequency of Problem Episodes score (4 or greater) as well as a relatively high subjective rating of Sleep Difficulty: Occurrence of Sleep Problems (at least 6).

High Distress Poor Sleepers were those Poor Sleepers whose subjective Sleep Distress: Level of Distress was 6 or greater and whose Sleep Distress: Frequency of Distress Episodes score was at least 9.

Low Distress Poor Sleepers were those Poor Sleepers whose subjective Sleep Distress: Level score fell below the mid-point on the scale (5 or less) and whose Sleep Distress: Frequency score was 8 or less.

Good Sleepers were individuals who (1) failed to meet the criteria for diagnosis of psychophysiological insomnia and who met the following requirements: (2) Sleep Difficulty: Frequency score 3 or lower, (3) subjec-

tive Sleep Difficulty: Occurrence score below the midpoint of the scale, (4) Sleep Distress: Frequency score below 3, and (5) subjective Sleep Distress: Level score 3 or lower.

Sample 1. Sample 1 included 189 older individuals (62 men and 127 women; mean age = 70, range = 55–89) who met the selection criteria for our larger investigation of sleep, aging, and nondrug treatment of insomnia (Creti *et al.*, 1994a; Fichten *et al.*, 1995; Libman *et al.*, 1995). For this larger investigation, both good and poor sleepers were recruited through media publicity consisting of press releases, presentations and mailings to seniors' groups, and notices in community clinics and residences for seniors. Selection criteria were (a) age 55 and over and (b) community resident, (c) prescription sleep medication, if used, was currently taken less than 3 nights per week (this criterion is consistent with sample selection in published studies on psychological interventions for insomnia), (d) psychological status: currently not receiving psychiatric or psychological care, no evidence of psychopathology or depression, (e) physical status: absence of major illness or drug use directly associated with sleep disturbance (cf. Lacks, 1987; Nicassio and Buchanan, 1981), (f) no evidence of physically based sleep disturbance (e.g., sleep apnea, restless leg syndrome, nocturnal myoclonus), based on subjects' self-reported history, and (g) no evidence of parasomnias or sleep phase disorder (e.g., phase delay, phase advance, or deregulation of circadian cycles).

Of the 189 individuals in Sample 1, 116 participants (mean age = 70, range = 55 to 87) met the rigorous criteria for one of the three sleep status categories: Good Sleeper (*n* = 60), Low Distress Poor Sleeper (*n* = 29), or High Distress Poor Sleeper (*n* = 27). The sex ratio in all samples was approximately one-third male and two-third female.

Poor Sleepers had experienced insomnia for a mean of 16 years (range = .5 to 60), suggesting that they were experiencing a chronic, rather than an acute sleep problem; there was no significant difference between Low and High Distress Poor Sleepers on this variable. In general, subjects were "middle class" (the typical subject's income was approximately $30,000 and almost 40% of subjects had attended university).

Subjects completed questionnaires assessing socioeconomic, psychological, and physical health factors as well as a wide range of sleep characteristics. These were completed on an individual basis under the supervision of a member of the research team during two sessions in our laboratory. Sessions were spaced 1 week apart. The structured interview was administered during the first session. Subjects returned the Daytime Activity Record Form, which required 1 week of recording at home, at the time of the second session. Poor sleepers who were not appropriate for

our ongoing treatment study or whose sleep complaint appeared to have a medical basis were given appropriate referrals.

Sample 2. Four hundred forty-five individuals (136 men, 309 women; mean age = 68; range = 55 to 88) completed measures in Sample 2. While they were not participating in the larger investigation described earlier, they were recruited in similar ways. However, the only eligibility requirements were over age 55, community resident, and volunteer. Individuals participated on an anonymous basis and completed measures either in a seniors' group context or at home. Approximately 75% of subjects belonged to university or college seniors' groups.

Two hundred eighty of the Sample 2 participants met the criteria for the three sleep status groupings: Good Sleeper (n = 189), Low Distress Poor Sleeper (n = 55), and High Distress Poor Sleeper (n = 36). Because of the treatment aspects of the larger investigation, Sample 1 contains a disproportionately large number of Poor Sleepers; Sample 2 probably better resembles population parameters of well-functioning older community residents in this regard (cf. Prinz, 1994). The sex ratio in all samples was approximately one-third male and two-thirds female. The three groups differed slightly, but significantly, on age (see Table IV). Poor Sleepers had experienced insomnia for a mean of 13 years (range = 1 to 63); there was no significant difference between High and Low Distress Poor Sleepers on this variable.

All subjects completed an abbreviated version of the Sleep Questionnaire. They also completed the following measures: Self-Statement Test: 60+ (SST:60+), Overall Level of Tension While Trying to Fall Asleep, and Sleep Strategies Questionnaire.

RESULTS

To simplify presentation of the results, findings for Samples 1 and 2 are presented together.

Relationships Among Sleep Characteristics

The pattern of correlations in Table I suggests that scores based on the Sleep Questionnaire have acceptable validity for research, as there were logical, strong, and highly significant relationships among variables. It is noteworthy that while all measures of nighttime functioning are significantly related to one another, Daytime Functioning scores do not follow this trend. Indeed, most correlations between the two Daytime Functioning

measures and scores which reflect actual time spent asleep and awake are generally low and non-significant. Also, it is interesting that sleep Self-Efficacy is more closely related to the likelihood of Sleep Difficulty and Distress than to variables measuring time spent asleep or awake during the night. The data also show moderate but significant correlations between poorer sleep and the use of more varied Sleep Strategies, with individuals experiencing poorer sleep using a greater number and diversity of sleep strategies. Moreover, Desired Sleep is most closely related to actual sleep time — i.e., people who slept more expected to sleep longer.

Differences Among Groups: Sleep Characteristics

Nighttime Functioning. As is evident in Table II, which presents means and test results for sleep and insomnia variables not used to classify subjects into the three sleep status groups, the sleep characteristics of the three sleep status groups in Sample 2 are similar to those of Sample 1. Good Sleepers in both samples experienced considerably better sleep than either group of Poor Sleepers; for example, they slept between 1.5 and 2.5 hr more than Poor Sleepers. A multivariate analysis of variance (MANOVA) and a series of one-way analysis of variance (ANOVA) comparisons on these variables were all highly significant ($p < .001$). Tukey HSD test results, with the alpha level set at .05, show that on all three key variables related to time (Total Sleep Time, Total Wake Time, Sleep Efficiency), the scores of Poor Sleepers — both High and Low Distress — were significantly different from those of Good Sleepers in both samples. The same is true for Sleep Self-Efficacy and for the variety of Sleep Strategies used. Although the worst scores on these variables were obtained by High Distress Poor Sleepers, differences between High and Low Distress Poor Sleepers were generally minimal and, for the most part, nonsignificant.

Daytime Functioning. The pattern of findings on Daytime Functioning is quite different. While High Distress Poor Sleepers reported experiencing considerably greater Sleepiness and more frequent Fatigue than Good Sleepers, Low Distress Poor Sleepers resembled Good Sleepers in this regard.

Expectations and Beliefs. Findings on Desired Sleep Time, presented in Table II, indicate that both Good Sleepers and High Distress Poor Sleepers desired a similar amount of sleep — approximately 7 hr. Low Distress Poor Sleepers had more modest expectations; they desired significantly less sleep than either Good Sleepers or High Distress Poor Sleepers, who did not differ significantly. Frequency data indicate that 82% of Good Sleepers believed that they slept better than others their own age. Fifty-two percent of both Low and High Distress Poor Sleepers believed

Table II. Sleep and Insomnia Characteristics: Mean Scores of Good Sleepers and High and Low Distress Poor Sleepers

		Poor sleepers		
Variable	Good sleepers	Low distress	High distress	Tukey HSD test ($p < .05$)
Time: actual[a]				
Total Sleep Time				
Sample 1	6.90 hr	4.96 hr	4.31 hr	Hi=Lo<Good
Sample 2	7.13 hr	5.56 hr	5.29 hr	Hi=Lo<Good
Total Wake Time				
Sample 1	1.04 hr	3.04 hr	3.65 hr	Hi=Lo>Good
Sample 2	.25 hr	2.63 hr	3.97 hr	Hi>Lo>Good
Sleep Efficiency				
Sample 1	87%	64%	56%	Hi=Lo<Good
Sample 2	97%	70%	58%	Hi<Lo<Good
Time: desired sleep	7.16 hr	6.28 hr	6.94 hr	Hi=Good>Lo
Sleep Strategies[a]				
Sample 1	1.89	2.62	3.00	Hi=Lo>Good
Sample 2	25.56	36.47	36.96	Hi=Lo>Good
Self-Efficacy Scale	38.88	28.07	22.15	Hi<Lo<Good
Daytime Functioning				
Fatigue due to lack of sleep				
(days/week)	.92 day	1.76 days	4.08 days	Hi>Lo=Good
Stanford Sleepiness Scale	1.75	1.96	3.48	Hi>Lo=Good

Note. Sample 1 scores unless indicated otherwise. All one-way ANOVAs were significant at the .001 level. Sample 1 dfs range from 2,103 to 2,113; Sample 2 dfs range from 2,231 to 2,274.

[a] These variables were calculated differently for Samples 1 and 2 because of differences in available scores. For Sample 1: Sleep Efficiency was calculated by dividing Total Sleep Time by Total Bed Time. Total Wake Time is the result of subtracting Total Sleep Time from Total Bed Time. Sample 2: Total Wake Time is the result of summing three daily wake times (sleep onset latency, waking after sleep onset, early morning wakefulness). Sleep Efficiency was calculated by dividing Total Sleep Time by the sum of Total Sleep Time and Total Wake Time. Sleep Strategies are based on open-ended listing in Sample 1 and on the Sleep Strategies Questionnaire Scores in Sample 2.

their sleep experience to be similar to that of others, with less than half believing it to be worse.

Differences Among Groups: Psychological Adjustment

Low Distress Poor Sleepers experienced substantial sleep problems. By definition, they were not appreciably distressed by these. Therefore, we

expected people in this group to be better adjusted, especially on state measures, than High Distress Poor Sleepers. Because anxiety and psychological maladjustment can be both the cause and the consequence of a sleep problem, we did not make specific predictions about comparisons between Good Sleepers and Low Distress Poor Sleepers, although we did expect Good Sleepers to be better adjusted on all variables than High Distress Poor Sleepers.

To ascertain whether the three groups of subjects differed on state and trait measures of psychological adjustment, MANOVAs were made on psychological adjustment scores for Sample 1 and Sample 2 separately; as these were significant, a series of one-way ANOVA comparisons was also made. Means and test results are given in Table III.

The results show that (1) Good Sleepers had significantly better scores than High Distress Poor Sleepers on all state and trait measures of psychological *maladjustment* (i.e., trait measures: BSI Depression, BSI Global Severity Index, EPI Neuroticism, and Penn State Worry Questionnaire; state measures: Anxious Self-Statement Questionnaire, Pre-Sleep Arousal Cognitive and Somatic Subscales, Overall Level of Tension While Trying to Fall Asleep, and Cognitive Content Questionnaire and Self-Statement Test: 60+ Negative Thought frequencies); (2) although scores of Low Distress Poor Sleepers generally fell between those of Good Sleepers and High Distress Poor Sleepers, Good Sleepers and Low Distress Poor Sleepers did not differ significantly from each other on several of these variables; (3) while the means were in the predicted direction, none of the comparisons on variables measuring the *presence of good adaptation* were significant (Satisfaction With Life Scale, Cognitive Content Questionnaire and SST:60+ Positive Thoughts); and (4) the significant Group × Valence interactions on the two-way ANOVA comparisons on both thought measures [3 Groups (Good\Low Distress\High Distress) × 2 Valence (Positive\Negative)] indicate that High Distress Poor Sleepers had relatively fewer Positive and more Negative thoughts than Good Sleepers.

It was possible that differences between groups on psychological adjustment were due to differences in sleep problem severity, even though others have shown that the severity of insomnia (based on sleep onset latency) was generally unrelated to psychological adjustment (Levin *et al.*, 1984; Shealy *et al.*, 1980). Therefore, a series of analysis of covariance (ANCOVA) comparisons was made on psychological adjustment variables, using Sleep Efficiency as the covariate; in all cases, the same comparisons were significant as on the ANOVAs.

Table III. Psychological Adjustment: Mean Scores of Good Sleepers and High and Low Distress Poor Sleepers on State and Trait Measures

Variable	Good sleepers	Poor sleepers		F	p <	Tukey HSD test (p < .05)
		Low distress	High distress			
Psychological Adjustment: Miscellaneous Trait Measures						
Poor Adjustment: BSI Global Severity Index	.41	.45	.66	3.47	.05	Hi>Good
Poor Adjustment: BSI Depression	.40	.47	.82	4.83	.01	Hi>Good
Good Adjustment: Satisfaction with Life Scale	23.11	22.97	20.72	1.23	ns	
Anxiousness: Trait Measures						
Eysenck Personality Inventory: Neuroticism	6.13	8.74	11.11	9.10	.001	Hi=Lo>Good
Penn State Worry Questionnaire	37.39	43.83	56.56	14.93	.001	Hi>Lo=Good
Anxiousness While Trying to Fall Asleep: State Measures						
Anxious Self-Statement Questionnaire (ASSQ)	46.23	48.07	62.56	6.08	.01	Hi>Lo=Good
Pre-Sleep Arousal Scale: Cognitive Subscale	10.73	14.28	18.08	20.95	.001	Hi>Lo>Good
Pre-Sleep Arousal Scale: Somatic Subscale	8.72	10.21	9.96	9.44	.001	Hi=Lo>Good
Overall Level of Tension Sample 2	17.16	36.00	55.56	49.29	.001	Hi>Lo>Good
Thoughts While Trying to Fall Asleep: State Measures						
Valence × Group Interaction						
Cognitive Content Questionnaire Sample 1				5.39	.01	Interaction
Self-Statement Test: 60+ (SST:60+) Sample 2				18.77	.001	Interaction
Positive Thoughts						
Cognitive Content Questionnaire Sample 1	1.64	1.63	1.17	.83	ns	
Self-Statement Test: 60+ (SST:60+) Sample 2	27.70	28.67	29.53	.41	ns	
Negative Thoughts						
Cognitive Content Questionnaire Sample 1	.53	1.37	1.74	6.85	.01	Hi=Lo>Good
Self-Statement Test: 60+ (SST:60+) Sample 2	18.02	25.85	33.36	39.83	.001	Hi>Lo>Good

Note. Unless otherwise indicated, scores are for Sample 1. Sample 1 dfs range from 2,93 to 2,110; Sample 2 dfs range from 2,273 to 2,277.

Lifestyle and Socioeconomic Variables

To evaluate similarities and differences in factors associated with life-style and daily living, MANOVAs on valenced (positive\negative) and nonvalenced lifestyle and demographic variables were made. Means and test results for a series of one-way ANOVA comparisons on these variables are listed in Table IV; as was the case for psychological adjustment, AN-COVAs, with Sleep Efficiency as the covariate, indicated the same significant findings.

In general, comparisons on nonvalenced variables were not signifi-cant, while those on valenced variables were. For example, the results show that the three groups were very similar on a vast range of socioeconomic and lifestyle variables: (1) Education, Age, Life Events, Income Level, Ade-quacy of Income, (2) regularity of habits — both sleep and nonsleep, (3) lifestyle characteristics such as Diversity of Daily Activities and ratings of How Busy participants perceived themselves to be, and (4) sleep lifestyle factors such as Naps, Bedtimes, Arising Times, Time Spent in Bed, and Falling Asleep Outside the Bedroom. The χ^2 test indicates that Good Sleepers and High and Low Distress Poor Sleepers did not differ signifi-cantly on Ease Sleeping Outside the Bedroom; indeed, only 16% of Good Sleepers and 21% of both groups of Poor Sleepers found it easier to fall asleep in places other than their bedrooms.

When the lifestyle variables included valence (i.e., positive and nega-tive aspects of lifestyle), however, the findings were quite different. Here, the results suggest that it is the presence of positive, favorable ratings which characterizes Good Sleepers and, to a lesser extent, Low Distress Poor Sleepers, in comparison with High Distress Poor Sleepers. For example, Good Sleepers evaluated the Quality of their daytime experiences as sig-nificantly more pleasant than High Distress Poor Sleepers. Also, the one-way ANOVA on Positive Activities was significant. While the means were in the expected direction, the comparison on Negative Activities was not significant. However, as in the case of valenced thoughts, the Group × Valence interaction on the two-way ANOVA comparison (3 Groups × 2 Valence) was significant; this shows that Good Sleepers indicated rela-tively more Positive and fewer Negative Activities than High Distress Poor Sleepers.

Relationships Among Psychological Adjustment, Lifestyle, and Sleep

Pearson product–moment correlation coefficients in Table V show that adjustment and lifestyle factors are most consistently related to sleep

Table IV. Lifestyle Variables: Mean Scores of Good Sleepers and High and Low Distress Poor Sleepers

Variable	Good sleepers	Poor sleepers		F	$p <$	Tukey HSD test ($p < .05$)
		Low distress	High distress			
Activities						
Valenced						
Daytime Quality	4.09	3.75	3.39	6.66	.01	Hi<Good
Total Number of Activities Valence × Group Interaction				4.84	.01	Interaction
Positive Activities	45.07	38.46	34.24	6.54	.01	Hi<Good
Negative Activities	5.86	6.43	7.67	.56	ns	
Nonvalenced						
Diversity of Daily Activities	11.40	10.46	10.29	1.69	ns	
How Busy	6.95	6.24	6.68	1.24	ns	
Regularity of lifestyle						
Variability in Meal Times (hr)	.46	.44	.43	.17	ns	
Variability in Bedtimes (hr)	1.90	2.30	1.88	1.66	ns	
Variability in Out of Bed Times (hr)	1.56	1.92	1.54	1.39	ns	
Sleep lifestyle factors						
Bedtime (PM)	11.25	11.05	10.98	1.01	ns	
Arising Time (AM)	7.18	7.05	6.98	.35	ns	
Time Spent in Bed (hr)	7.93	8.00	7.97	.04	ns	
Days Napped per Week	1.86	1.57	1.78	.16	ns	
Falling Asleep Outside the Bedroom (days)	2.32	2.57	2.58	.71	ns	
Demographic and socioeconomic factors						
Age						
Sample 1	70.27	70.07	68.96	.35	ns	
Sample 2	66.36	69.74	67.21	4.67	.01	Good<Lo
Education Category	2.41	2.32	2.15	1.73	ns	
Income Category	3.61	4.05	3.63	.64	ns	
Adequacy of Income	5.56	5.45	4.93	1.36	ns	
Life Events Scale	.51	.38	.55	.42	ns	

Note. Scores are for Sample 1 unless indicated otherwise.

Table V. Relationship Among Psychological Adjustment, Lifestyle, and Sleep Insomnia Measures

	Psychological adjustment													Lifestyle		
	Adjustment			Anxiousness						Thoughts State					Activities	
	Poor		Good	Trait		State				Positive		Negative				
	BSI Severity	BSI Depres.	Life Sat	Neurot.	Worry	ASSQ	Cognitive	Somatic	Tension[a]	CCQ	SST 60+[a]	CCQ	SST 60+[a]	Daytime Quality	Pos.	Neg.
Time: actual																
Total Sleep Time	-.04	.04	.01	-.13	-.12	-.02	-.26**	-.14	-.20**	.01	-.12	-.11	-.24**	.23**	.10	-.07
Total Wake Time	-.05	-.10	.09	.12	.11	-.01	.14	.13	.29**	-.02	.02	-.02	.40**	-.07	-.09	-.01
Sleep Efficiency	.01	.07	-.07	-.16*	-.14	-.02	-.18*	-.12	-.30**	.01	-.05	-.02	-.42**	.11	.11	-.03
Time: Desired Sleep	.07	.10	-.02	-.06	.06	.07	.01	.05		.07		.00		.01	-.05	.02
Sleep Strategies	.00	-.10	.07	.18*	.09	-.06	.19*	.02	.31**	.20*	.43**	.05	.52**	.00	.00	.05
Sleep Difficulty																
Frequency	.14	.14	-.10	.31**	.39**	.14	.42**	.17*	.40**	-.02	.05	.23**	.46**	-.16	-.28**	.06
Occurrence	.17*	.11	.00	.30**	.33**	.12	.41**	.23**	.40**	-.03	.04	.21**	.41**	-.27**	-.30**	.07
Self-Efficacy	-.43**	-.31**	.20**	-.52**	-.50**	-.36**	-.61**	-.37**		.06		-.31**		.35**	.28**	-.08
Daytime Functioning																
Fatigue	.31**	.32**	-.14	.37**	.23**	.24**	.23**	.24**		-.17*		.13		-.16	-.32**	.16*
Sleepiness	.32**	.36**	-.16*	.22**	.21*	.21**	.19*	.15		-.21**		.15		-.25**	-.33**	.15
Sleep Distress																
Frequency	.27**	.26**	-.17*	.39**	.47**	.28**	.49**	.17*	.42**	-.13	.09	.31**	.47**	-.32**	-.28**	.10
Level	.32**	.28**	-.15	.40**	.45**	.25**	.50**	.28**	.45**	.04	-.02	.32**	.41**	-.32**	-.22**	.05

Note. Sample 1 scores, except as indicated otherwise. Sample 1 sizes vary from 147 to 189. Sample 2 sizes vary from 374 to 445.
[a] Sample 2 scores.
*p < .05.
**p < .01.

parameters which have appreciable cognitive and affective loading (i.e., ratings of sleep Self-Efficacy and Distress concerning one's sleep problem). Correlations with more "objective" aspects of the sleep experience, such as sleep parameters related to actual amount of time spent asleep or awake (i.e., Total Sleep Time, Total Wake Time, Sleep Efficiency) were generally small and nonsignificant.

Sleep expectations (Desired Sleep) were not related to psychological adjustment; none of the coefficients are significant and r values range from 0 to .07. Findings on Sleep Strategies suggest that people who experience frequent Negative Thoughts when trying to sleep are particularly likely to use a variety of sleep strategies. Although seemingly counterintuitive, there is also a strong positive relationship between Positive Thought frequency and Sleep Strategy use. This, however, is an artifact, as deliberately thinking positive thoughts is a common strategy used by people to help put themselves to sleep.

It is noteworthy that, as was found using ANOVAs, scores on measures of good adaptation (Satisfaction With Life Scale, Cognitive Content Questionnaire and SST:60+ Positive Thoughts) were not as closely related to sleep parameters as were measures of poor adjustment. Again, the reverse was true for lifestyle variables, where positive rather than negative evaluations showed closer relationships with cognitive-affective sleep parameters. Consistent with views expressed by many sleep researchers and clinicians, data in Table V also show that Cognitive aspects of state anxiety were more closely related to troubled sleep than Somatic aspects. This suggests that the high correlations found in this investigation between "Tension" and sleep parameters probably reflect cognitive rather than somatic "tenseness." Finally, state and trait aspects of anxiety appear to be equally good correlates of sleep parameters, suggesting that poorer adaptation in highly distressed poor sleepers is not limited to the sleep experience.

Daytime Functioning: Resolving the Paradox

At first glance, the data in Table V suggest that Daytime Functioning measures behave similarly to other cognitive-affective sleep variables such as Sleep Distress and Self-Efficacy. Yet there are important differences which deserve comment; these suggest that poor Daytime Functioning is more closely associated with depression, while poor nocturnal functioning and adjustment are more closely related to sleep and wake times and to anxiety.

The results show that correlations between Daytime Functioning and Anxiousness scores were relatively low, and that correlations with Depres-

sion and the absence of Positives (Thoughts, Activities) were relatively high, in comparison with other cognitive-affective sleep measures. In other literatures such a pattern is usually found in the depressed sample when mildly depressed and anxious populations are compared; although there is substantial overlap, symptoms of anxiety in depressed people are quite common, while depressive symptoms in anxious people are generally less so (e.g., Bruch *et al.*, 1993; Clark *et al.*, 1989; Fichten *et al.*, 1988; Ingram, 1989; Kendall *et al.*, 1989; McDermut and Haaga, 1994).

For Good Sleepers, Daytime Fatigue and Sleepiness cannot be attributed to an insomnia problem. Therefore, to test the hypothesis that Daytime Fatigue and Sleepiness are more closely related to Depression than to insomnia, we examined the relationship between Daytime Fatigue and Sleepiness in relation to sleep parameters, lifestyle, and adjustment in Good Sleepers. The two measures of Daytime Functioning were highly and significantly correlated ($r = .55, p < .01$); all correlations between Daytime Functioning scores and other sleep parameters were low and non-significant. What is interesting is that in Good Sleepers, Daytime Functioning was related primarily to measures which reflect a "depressed" rather than an "anxious" picture (see Table VI).

We also examined Daytime Fatigue and Sleepiness in the other group which was reasonably homogeneous on sleep quality: the Poor Sleepers. Once more the pattern of correlations in Table VI suggests that in Poor Sleepers, too, Daytime Functioning is more closely related to Depression than either state or trait Anxiety, raising the possibility that Daytime Fatigue and Sleepiness in people complaining of insomnia may be erroneously attributed to the DIMS problem, rather than to other sources such as low, subclinical levels of depression.

Three Aspects of the Insomnia Complaint: Difficulty Sleeping, "Daytime Sequelae," and Distress About the Problem

To understand better the factors which contribute to complaints of (1) daytime fatigue and sleepiness, (2) difficulty falling asleep and getting back to sleep, and (3) distress about the DIMS problem, we performed a series of linear regression analyses. Here the objective was to evaluate the relative contribution of nocturnal sleep parameters (Total Sleep Time, Total Wake Time), State Anxiety (Cognitive Arousal), and Depression to each of these aspects of the insomnia complaint. As can be in Table VII, the predictors are substantially different, depending on the aspect of the sleep complaint examined. Daytime Functioning was predicted only by Depression, which explained less than 13% of the variability in scores. Sleep

Table VI. Homogeneous Groups: Relationship Among Psychological Adjustment, Lifestyle, and Daytime Functioning in Good and in Poor Sleepers

	Psychological adjustment										Lifestyle		
	Adjustment			Anxiousness					Thoughts: State			Activities	
	Poor		Good	Trait			State		Pos.	Neg.			
	BSI Severity	BSI Depres.	Life Sat.	Neurot.	Worry	ASSQ	Cognitive	Somatic	CCQ	CCQ	Daytime Quality	Pos.	Neg.
Good Sleepers													
Daytime Fatigue	.19	.20	-.29*	.23	.04	.09	-.00	.28*	-.21	.07	-.13	-.07	.19
Daytime Sleepiness	.28*	.35**	-.31*	.15	.02	.05	-.02	.35**	-.18	.01	-.23	-.30*	.31*
Poor Sleepers													
Daytime Fatigue	.35**	.30**	-.12	.31**	.15	.26*	.12	-.04	-.21	.12	-.19	-.38**	.23
Daytime Sleepiness	.29*	.30*	.06	.15	.20	.19	.10	-.06	-.22	.07	-.20	-.31**	.14

Note. Sample 1 scores. Sample sizes vary from 47 to 60 for Good and from 63 to 79 for Poor Sleepers.
*p < .05.
**p < .01.

Table VII. Predictors of Selected Aspects of the Insomnia Complaint

Predicted variable	Predictor variable[a]	β	t	p <
Daytime Functioning				
Fatigue	Depression	.30	3.93	.001
	Adj. R^2 = 13, $F(4,174)$ = 7.59, $p < .001$			
Sleepiness	Depression	.36	4.40	.001
	Adj. R^2 = .12, $F(4,161)$ = 6.79, $p < .001$.			
Sleep Difficulty				
Frequency of problem	Total Sleep Time	-.42	-5.40	.001
episodes	Total Wake Time	.29	3.76	.001
	Anxiety	.23	4.04	.001
	Adj. R^2 = .57, $F(4,175)$ = 60.72, $p < .001$			
Occurrence of sleep	Total Sleep Time	-.41	-5.05	.001
problems	Total Wake Time	.27	3.41	.001
	Anxiety	.25	4.22	.001
	Adj. R^2 = .54, $F(4,176)$ = 53.16, $p < .001$			
Sleep Distress				
Frequency of distress	Anxiety	.35	5.42	.001
episodes	Total Sleep Time	-.30	-3.36	.001
	Total Wake Time	.20	2.29	.05
	Depression	.14	2.33	.05
	Adj. R^2 = .45, $F(4,174)$ = 36.88, $p < .001$			
Level of distress	Anxiety	.34	5.12	.001
	Total Sleep Time	-.28	-3.07	.01
	Total Wake Time	.20	2.29	.05
	Depression	.17	2.76	.01
	Adj. R^2 = .45, $F(4,168)$ = 35.65, $p < .001$			

Note. Sample 1 scores.
[a] Predictor variables entered were Total Sleep Time, Total Wake Time, Anxiety: State (Cognitive Arousal), and Depression.

Difficulty was best predicted by Total Sleep and Wake Times. State Anxiety was a poorer, although still significant, predictor; these three variables explained over 50% of the variability in scores. Depression failed significantly to predict Sleep Difficulty. Sleep Distress was, not surprisingly, best predicted by State Anxiety. Total Sleep and Wake Times were also significant predictors. While Depression also made a significant contribution, this variable was the poorest predictor. Altogether, the four predictors explained 45% of the variability in Sleep Distress.

DISCUSSION

We must stress that while the number of participants in this investigation was reasonably large, 634 people, our samples consisted of individuals who lived in the community and were generally healthy, well-adjusted, educated, and financially comfortable. Therefore, the findings may not be generalizable to other, less advantaged older populations. It is also possible that our volunteer poor sleepers' insomnia problems may not have been as severe as those of people who seek medical treatment. While this, too, could affect the generalizability of the findings, we consider it unlikely. The sleep parameter scores of our poor sleepers show severe sleep problems. For example, they slept, on average, between 4 and 6 hr and had sleep efficiencies under 70%. In addition, the literature suggests that poor sleeper volunteers do not differ on sleep characteristics from people who seek out treatment (Stepanski et al., 1989). Furthermore, available data demonstrate that severity of insomnia is generally unrelated to psychological adjustment (Levin et al., 1984; Shealy et al., 1980).

It should also be noted that many of the significant correlations we discuss are based on r values which hover near the .30 level. These, of course, are relatively low. The findings are consistent and robust, however; all are in the same direction, the relationships hold for multiple measures of the same constructs, and findings are replicated in two samples. Nevertheless, confirmation from other laboratories is needed before making definitive conclusions based on these data.

Good and Poor Sleep and Psychological Adjustment

Almost half of our older participants neither experienced nor were troubled by poor sleep. When various sleep parameters were examined more closely, these individuals indeed appeared to sleep longer and to manifest substantially less frequent and severe sleep disruptions than people diagnosed as poor sleepers. Might it be that this segment of individuals escaped the usual physiological age-related changes in sleep architecture? This question, obviously, cannot be answered without polysomnographic (PSG) examination. Indeed, one of the major limitations of our investigation is the absence of such PSG data. What our findings do show is that, in addition to having good sleep, these fortunate individuals were also conspicuously free of psychological maladjustment (although neither they nor the low distress poor sleepers demonstrated the presence of especially good adjustment). Given the substantial number of such people, further investigation of the contributors to good sleep in older individuals is clearly warranted.

Poor sleepers in our samples experienced considerably worse sleep than good sleepers on "objective" aspects — total sleep time, total wake time, and sleep efficiency. Poor sleepers reporting high and low distress about the problem were fairly similar on severity as well as duration of the problem. On both trait and state measures of psychological *mal*adjustment and *negative* adaptation, however, it was frequently the good sleepers and the minimally distressed poor sleepers who had similarly low levels of anxiety and maladjustment, in comparison to those who were highly distressed about their sleep problem.

The highly distressed poor sleepers' scores reflect an anxious, depressed, worrying and negative cognitive-affective set. Also, our data indicate that scores on measures of poor psychological adjustment correlated particularly well with those sleep parameters which reflect the *complaint* of insomnia, such as Sleep Distress, Self-Efficacy, and Daytime Functioning. Correlations between scores on measures of poor adjustment and more "objective" criteria of poor sleep, such as sleep and wake times, however, were low and generally nonsignificant.

The finding of poorer psychological adjustment in older people with insomnia is similar to results reported by others (e.g., Gourash-Bliwise, 1992; Morgan *et al.*, 1989; Morin and Gramling, 1989). Our findings are unique in demonstrating the existence of substantial numbers of older poor sleepers who are not distressed by their sleep disorder and in describing their characteristics. This group of poor sleepers differs from those who are highly distressed not in that they experience less problematic sleep, nor, as the findings on lifestyle factors attest, in that they lead more regular or stress free lives. What distinguishes them is that, unlike their highly distressed peers, low distress poor sleepers *do not manifest poor psychological adjustment.* Adding to hints and reports in the literature that some "insomniacs" do not experience high levels of anxiety, tension, or arousal (Chambers and Kim, 1993; Lichstein and Rosenthal, 1980; Seidel *et al.*, 1984; Stepanski *et al.*, 1989) and to demonstrations that amount of sleep deprivation in insomnia complainers in many cases is of no great clinical significance (Chambers and Keller, 1993), our data support the proposition that more or less sleep or wake time does not fully explain the severity of the insomnia complaint or the accompanying daytime fatigue and impairment that is typically reported.

The huge differences in sleep parameters between good sleepers and low distress poor sleepers, together with the similarities between these two groups on adjustment and cognitive-affective responses, corroborate our initial impression that the "low distress poor sleeper" group is critical to understanding the *complaint* of insomnia in older individuals. People in this category represent a poorly documented but substantial segment of the aging

population: those who are coping well with the psychophysiological changes in sleep architecture which typically accompany the aging process.

Consistent with views expressed by many sleep researchers and clinicians, our findings indicate that cognitive aspects of state anxiety are more closely related to troubled sleep than are somatic aspects. Therefore, our data on thoughts experienced by older individuals during times of sleeplessness — and the Self-Statement Test: 60+ measure which we developed to assess these (Fichten et al., 1995) — are likely to be beneficial in evaluating these cognitive aspects in older people complaining of insomnia. We also found that both state and trait aspects of anxiety were closely related to the insomnia complaint, suggesting that poorer adaptation in highly distressed older poor sleepers is not limited to the sleep experience.

Whether psychological maladjustment in highly distressed poor sleepers precedes the onset of insomnia (e.g., Healey et al., 1981) or whether it results from sleeplessness (e.g., Morgan et al., 1989) cannot be determined by our data. Whatever their source, anxiety, depression, and a negative cognitive-affective set may contribute to sleep problems as well as to associated distress.

Three Aspects of the Insomnia Complaint: Difficulty Sleeping, "Daytime Sequelae," and Distress About the Problem

Our data suggest that the insomnia complaint itself is multifaceted and that cause–effect relationships differ, depending on the aspect under consideration. For example, when difficulty falling asleep and getting back to sleep was considered, the best predictors were actual times spent asleep or awake. Another facet of the insomnia complaint, distress about the sleep problem, was best predicted by anxiety. Daytime fatigue and sleepiness, which frequently fail to distinguish good sleepers and insomniacs (Lichstein et al., 1994) and are commonly attributed to sleep deprivation, were, in fact, better predicted by low levels of depression than by either sleep or wake times or by anxiety related to sleep. This association was equally evident in good and poor sleepers, raising the possibility that what are generally considered "daytime sequelae" of the insomnia problem may, in fact, reflect low, subclinical levels of depression. This possibility certainly merits further investigation.

The manifestation of these separable aspects of the insomnia complaint, as well as their associated predictors, have important implications for therapeutic effectiveness. For example, daytime fatigue may best be treated by addressing the low level depression, rather than by trying to increase sleep time. High distress over the sleep problem may respond to anxiety management, leaving experienced difficulty falling asleep and get-

ting back to sleep as the only aspect of the insomnia complaint where total sleep and wake times must be addressed directly.

Biopsychosocial Factors in Older Individuals' Sleep Experience

Equally important are our consistently negative findings on lifestyle and demographic factors; these show that the three groups of older individuals closely resembled each other in virtually all aspects of lifestyle. For example, there were no differences in the diversity of activities engaged in or in perceptions about how fully one's time was occupied. Nor did the three groups differ on education or on either income level or adequacy. Our findings support other investigators who have shown economic dissatisfaction to be unrelated to sleep quality in older individuals (Frisoni *et al.*, 1993). Epidemiological surveys have found that people with low incomes were considerably more likely to experience poor sleep than people with higher incomes (e.g., Tait, 1992). Here, however, other health and psychosocial variables related to poverty must be taken into consideration.

Exposure to stressful life events (such as the death of a loved one) was also similar in our three groups. While major negative life events have been implicated in the onset of insomnia (Healey *et al.*, 1981; Kales *et al.*, 1984), it seems that large, but infrequent stressors are not involved in the maintenance of chronic sleep problems.

While negative findings can never be conclusive, our results add to the growing body of evidence (e.g., Gourash-Bliwise, 1992; Morin and Gramling, 1989) which highlights the absence of differences in lifestyle in older individuals with and without insomnia.

A dramatically different pattern emerged when cognitive-affective evaluations of lifestyle were considered. Good sleepers perceived their days to have been spent more pleasantly than did highly distressed poor sleepers. All participants in our study engaged in some activities which they viewed as aversive. A more favorable balance between activities evaluated as positive and as negative was maintained by good sleepers and minimally distressed poor sleepers, however, compared to their highly distressed poor sleeper counterparts. Whether our findings reflect a global tendency to perceive one's situation in a more positive — or negative — light or to actual differences in activities (e.g., Marchini *et al.*, 1983) is an empirical question.

Addressing Popular Myths About Insomnia in Older Adults

Unrealistic Expectations. It has been suggested that older individuals complaining of insomnia have unrealistic beliefs and expectations which, when not met, increase anxiety and distress, thereby perpetuating and aggravating the sleep problem (Morin and Gramling, 1989). Our data do not support the hypothesis that older poor sleepers have unreasonable expectations. For example, poor sleepers in our study were surprisingly optimistic about how their sleep experience compared to that of others. Although they were definitely in the minority, approximately 50% of both the low and the high distress poor sleeper groups indicated that their sleep was much the same as that of others their age. Also, good sleepers and highly distressed poor sleepers wanted similar amounts of sleep — approximately 7 hr — the amount actually obtained by our good sleepers. It is the low distress poor sleepers who had particularly modest expectations — ones which were more consistent with their more modest actual sleep times. While low distress poor sleepers may have adjusted their standards to fit their own realities, it is also possible that they are naturally short sleepers who do not need — or desire — the 7 hr obtained by their good sleeper peers. As do older good sleepers, this interesting category of low distress poor sleepers deserves further examination.

Maladaptive Sleep Lifestyle Factors and Erratic Daytime and Sleep Schedules. The popular and highly effective stimulus control treatment for insomnia (Bootzin, 1985; Bootzin and Nicassio, 1978) is based on the assumption that the bed and bedroom have become conditioned to sleep-incompatible behaviors such as reading, worrying, or tossing and turning. In keeping with this formulation, it is commonly believed that people with primary insomnia, "may fall asleep more easily when not trying to do so (e.g., while watching television, reading, . . ." and that "they sleep better away from their own bedrooms" [DSM-IV, p. 553 (American Psychiatric Association, 1994)]). Our data provide no support for the hypothesis that older poor sleepers fall asleep more easily away from their bedrooms; in this regard they were no different from good sleepers. Approximately 20% of individuals in all three groups indicated it was easier for them to fall asleep outside their bedroom. And when this did happen, it occurred with similar frequency in the three groups.

There are suggestions and assertions in the literature that poor sleep in older individuals is associated with maladaptive sleep lifestyle practices and poor "sleep hygiene," such as spending excessive amounts of time in bed, going to bed too early, taking frequent naps, and erratic bedtimes and arising times (Hoelscher and Edinger, 1988; Marchini *et al.*, 1983). Our data show that the three groups were very similar on these dimensions.

First, they experienced similarly regular lifestyles; they did not differ on variability in meal times or in the times they went to bed or got up in the morning. As demonstrated by others (Monk *et al.*, 1992), the hypothesis that impaired sleep in older individuals stems from an irregular lifestyle was not supported by our data. Second, all three groups spent similar amounts of time in bed — an average of approximately 8 hr. They also had similar bed times and arising times and they napped equally frequently; these, too, are findings similar to those reported by others (Gourash-Bliwise, 1992; Morgan *et al.*, 1989; Morin and Gramling, 1989). All suggest that neither sleep lifestyle factors nor faulty sleep hygiene play a role in the poor sleep experienced by many older individuals.

The efficacy of aspirin in alleviating headaches is never used to infer that lack of aspirin causes headaches. Evidence on the effectiveness of lifestyle changes in alleviating sleep complaints (e.g., Edinger *et al.*, 1992) should not be used to justify the assumption that older poor sleepers' maladaptive sleep hygiene and lifestyle practices cause either poor sleep or the complaint of insomnia.

Implications and Conclusions

What, then, are the implications for dealing with the complaint of insomnia in the older population? Our findings suggest that, as in all areas of behavioral medicine, the physiological, behavioral, cognitive, and affective dimensions must all be taken into account when evaluating the experience of insomnia as well. The data also suggest that the insomnia complaint is itself multifaceted; therefore, specific aspects of the sleep problem must be assessed and addressed by therapy. For example, difficulty falling asleep and maintaining sleep may require a direct focus on sleep disruptions (cf. Hauri and Linde, 1990; Morin, 1993). Alternately or additionally, the manner in which sleep disruption is expressed or interpreted may need to be addressed. For example, the complaint may center on daytime fatigue; here our findings implicate low, subclinical levels of depression as an appropriate intervention target. Alternately, the complaint may focus on distressing nighttime experiences and worry about the consequences of poor sleep. Our findings show that both state and trait anxiety — especially the cognitive aspects — are associated with feeling upset about the sleep problem. This suggests that high distress related to poor sleep may best be treated by focusing on managing the anxiety; a variety of successful demonstrations exist in this domain (Lichstein and Riedel, 1995).

The characteristics of our noncomplaining poor sleepers also highlight the importance of what Kendall (1984) called the "power of nonnegative

thinking." Our findings suggest that successful coping with psychophysiological changes associated with aging is more closely related to the absence of psychological maladjustment than to the presence of good adaptation or positive thinking.

There are several ways to eliminate negatives. One obvious means is through replacement with positives; helping people increase the frequency of positive appraisals, thoughts, and images may make the experience of disrupted sleep less aversive by eliminating associated negative cognitive-affective experiences and by suppressing maladaptive focus on worries and concerns. Interventions which help people refocus their attention (Creti et al., 1994a; Fichten and Libman, 1991) and cognitive therapy techniques seem ideally suited for this (cf. Morin, 1993; Morin et al., 1993; Sanavio, 1988).

All participants in our study engaged in some activities they experienced as aversive. This represents reality. Nevertheless, cognitive–behavioral interventions could encourage people both to increase the frequency of pleasurable and satisfying activities as well as to learn more adaptive cognitive-affective responses to various problematic life situations. This approach would allow the positive and negative aspects of daily life to achieve a more favorable balance which, we found, was characteristic of good sleepers and noncomplainers.

As is common in the investigation of good and poor psychological functioning in general, and in the area of sleep and aging in particular, it is easier to identify the presence of pathology than the precise components of good adjustment in well-functioning people. The present study is one of the few to focus on characteristics of older people who cope successfully with the ubiquitous and far-reaching problem of disrupted sleep. Overall, our findings show that the biggest differences between such individuals and those who are troubled by their sleep problem are less in the realm of what they do at night and more in the domain of how they think and feel, both in the day and during periods of nocturnal wakefulness.

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